

CLAIM LISTING

Please find below a complete listing of presently pending claims with status identifiers. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A process for modifying the surface characteristics of a substrate comprising:

applying a polymer comprising multiple epoxy groups and having a number average molecular weight of about 2000 or greater to a substrate surface, wherein the substrate is formed of a substrate material that comprises functional groups that are reactive with epoxy;

reacting only a portion of the epoxy groups on the polymer with at least a portion of the functional groups of the substrate material to bind the polymer directly to the substrate material at multiple points along the polymer; and

cross-linking the polymer via reaction of only a portion of the epoxy groups on the polymer to form a cross-linked polymeric anchoring layer bound directly to the substrate material at the substrate surface, wherein the anchoring layer comprises epoxy functionality.

2. (Original) The process of claim 1, further comprising grafting at least one material to the anchoring layer at the epoxy functionality.

3. (Original) The process of claim 2, wherein the at least one material comprises a polymerization initiator.

4. (Original) The process of claim 3, further comprising polymerizing a monomer on the anchoring layer at the polymerization initiator.

5. (Original) The process of claim 4, wherein the monomer is capable of radical polymerization.

6. (Previously Presented) The process of claim 4, wherein the monomer is selected from the group consisting of a vinyl aromatic, an acrylate, and a methacrylate.

7. (Original) The process of claim 2, wherein the at least one material comprises a polymer, a macromolecule, or a biomolecule.

8. (Original) The process of claim 1, wherein the polymer is applied to the substrate surface in a dip-coating process.

9. (Original) The process of claim 1, wherein the polymer is applied to the substrate surface heterogeneously.

10. (Original) The process of claim 1, further comprising grafting two or more materials to the anchoring layer.

11. (Original) The process of claim 1, further comprising heating the substrate to a temperature of between about 40°C and 150°C following application of the polymer to the substrate surface.

12. (Previously Presented) The process of claim 1, wherein the substrate is heated subsequent to application of the polymer comprising multiple epoxy groups to the substrate surface.

13. (Original) The process of claim 1, further comprising oxidizing the substrate surface prior to application of the polymer to the substrate surface.

14. (Previously Presented) The process of claim 1, wherein the polymer is selected from the group consisting of epoxidized polybutadiene, epoxidized polyisoprene, and epoxidized poly(glycidyl methacrylate).

15. (Currently Amended) The process of claim 1, wherein the polymer is covalently bound to the surface substrate material at multiple points along the polymer.

16. (Currently Amended) The process of claim 1, wherein the substrate material is a textile material, a fiber, a polymeric material, or an inorganic material.

17. (Currently Amended) A process for modifying the surface characteristics of a substrate comprising:

applying a polymer comprising multiple epoxy groups and having a number average molecular weight of about 2000 or greater to a substrate surface, wherein the substrate is formed of a substrate material that comprises functional groups that are reactive with epoxy;

reacting between about 5% and about 40% of the epoxy groups on the polymer with at least a portion of the functional groups of the substrate material to bind

the epoxy-containing polymer directly to the substrate material at multiple points along the polymer;

reacting between about 20% and about 30% of the epoxy groups on the polymer to form cross-links such that a cross-linked polymeric anchoring layer is formed bound directly to the substrate material, wherein the anchoring layer comprises epoxy functionality; and

grafting at least one material to the anchoring layer at the epoxy functionality.

18. (Original) The process of claim 17, wherein the at least one material comprises a polymerization initiator.

19. (Original) The process of claim 18, further comprising polymerizing a monomer on the anchoring layer at the polymerization initiator via an atom transfer radical polymerization.

20. (Previously Presented) The process of claim 19, wherein the monomer is selected from the group consisting of a vinyl aromatic monomer, an acrylate, and a methacrylate.

21. (Original) The process of claim 17, wherein the at least one material comprises a polymer, a macromolecule, or a biomolecule.

22. (Original) The process of claim 17, wherein the epoxy-containing polymer is applied to the substrate surface in a dip-coating process.

23. (Original) The process of claim 17, wherein the epoxy-containing polymer is applied to the substrate surface heterogeneously.

24. (Original) The process of claim 17, further comprising grafting two or more materials to the anchoring layer.

25. (Original) The process of claim 17, further comprising oxidizing the substrate surface prior to application of the epoxy-containing polymer to the substrate surface.

26. (Previously Presented) The process of claim 17, wherein the epoxy-containing polymer is selected from the group consisting of epoxidized polybutadiene, epoxidized polyisoprene, and epoxidized poly(glycidyl methacrylate).

27. (Previously Presented) The process of claim 17, wherein the epoxy-containing polymer is poly(glycidyl methacrylate) comprising epoxy functionality.

28-48. Cancelled.